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EXHIBIT A

**BARNES & THORNBURG**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group: 1641

Confirmation No.:

Application No.: 09/848,967

Invention: IMMUNOGENIC PEPTIDES AND
USES THEREOF

Applicant: Emanuel Calenoff and Charles Ditlow

Filed: May 4, 2001

Attorney

Docket: 21417/92378

Examiner: CHEU, CHANGHWA J

I hereby certify that this correspondence is being
deposited with the United States Postal Service as
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1450, Alexandria, VA 22313-1450

on July , 2004

Alice O. Martin
Registration No. 35,601

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Byron Anderson, have read the patent application captioned above. A copy of my curriculum vitae is appended to indicate my expertise in the area of the invention described therein.

I have approximately 39 years of research experience in protein and peptide structures, immunochemistry and antibody responses. I recently retired from a faculty position at the Medical School of Northwestern University after 32 years of service. I taught for all those years the subjects of protein structure and peptide chemistry, and immunochemistry, including the subjects of antibody binding to epitopes and what constitutes an epitope of various chemical natures. I am now employed as a consultant to two companies on the subjects: peptide immunogens for eliciting antibodies with

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selective reactivities to an alcoholic related form of the transferrin glycoprotein (this is the subject of a patent of which I am a co-inventor as listed on my CV), and a peptide library of D-aromatic rich peptides that show high affinities for various proteins of clinical interest (a patent application has been filed on this subject with myself as sole inventor as listed on the CV). We have also published papers and filed patent applications on the subjects: (1) production of antibodies to a N-terminal sequence of a connective tissue activating protein, (2) a peptide sequence which binds immune complexes, (3) antibodies to a reduced Glc-peptide of the N-terminus of glycated-hemoglobin which selectively binds such protein, and (4) a peptide sequence prediction algorithm for carbohydrate binding sites of proteins.

With this background I feel I can comment knowledgeably about the Calenoff – Ditlow patent application and the patent examiner's discussion.

1. I have no relationship to the patent application captioned above, and will not benefit financially from its commercial development.
2. In my review of the documents sent to me, I first read the review paper by Regenmortel, Mark H.V. (1998) ASM News/vol. 64, no. 6, pp. 332-338, then the Calenoff – Ditlow patent application, followed by the patent examiner's comments in the Office Action mailed May 17, 2004.
3. I understand that the examiner believes that several publications, in particular Regenmortel, teach the same things as the present invention, or make it obvious.
4. I will first describe the major elements of the Regenmortel paper and comment here and later on the relationship to the examiner's comments and the patent application as follows:
 - a. The Regenmortel paper (the paper) first explains what is generally accepted as definitions for epitopes of peptide chemical nature (continuous or discontinuous), and for paratopes (those portions of a receptor, for example, the antibody combining site regions), for epitope-paratope non-covalent binding interactions which define specificities and affinities, and why a peptide of dissimilar sequence from the epitope peptide sequence may bind into the same paratope regions via a summation of different atomic non-covalent bondings or by the use of other sub-regions within the paratope regions. The paper also describes mimotopes: Mimotopes are peptides

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usually identified from combinatorial peptide libraries which functionally mimic the epitope, ie, by binding with some defined affinity to the same receptor as the epitope (in the cases cited, binding to antibody combining sites). The sequence of the peptide mimotope may have some sequence similarity to the epitope or may have no sequence homology, the specific non-covalent bonding interactions of mimotope peptide to the paratope regions having some similarities or being very dissimilar to those of the epitope bondings. At this point it should be noted that mimotopes are not proteins, or peptide sequences derived from proteins, and mimotopes cannot be defined as a comparative protein as the examiner has done in his comments on the patent application.

In Figure 4, Regenmortel shows some viral protein peptide sequences and 4 mimotopes that show various amounts of homologies. The reason there are homologies of the mimotopes to the viral peptide sequences is: Peptide libraries are generated by phage tail protein displays of randomized sequences of peptides at the N-terminus of the tail protein, or the libraries are chemically synthesized on beads (Tenta-Gel beads are those preferred) by an addition - mix process. Such libraries (if all 20 different amino acids are used) should contain all possible peptide sequences of the length chosen (eg, hexapeptides). Therefore, within the library one should find both the exact sequence of an epitope of equal length as well as many peptides of sequence homology. Thus, the libraries of mimotopes will contain some number of peptide sequences that will functionally mimic an epitope and exhibit such homologies.

Regenmortel then has a short description of the prediction of viral antigens: surface accessibility of such peptide sequences and N- or C-terminal locations (by well known algorithms and as used by Calenoff-Ditlow), and mentions using overlapping peptide sequence analyses to empirically discover reactive peptides.

b. The Calenoff-Ditlow application describes methods for identifying epitopes of proteins of interest: A selection of proteins (the target proteins) of a microorganism or other protein associated with a disease state is first made. Then published algorithms are used to ascertain which peptide regions are more likely to be exposed on the protein surface and thus accessible for binding with antibody reagents. Then follows

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the unique and inventive steps of Calenoff-Ditlow: The protein surface probable sequences (the PSP sequences) are compared to all other known proteins (comparative proteins) for possible sequence homologies and those which are less than 50% homologous to sequences of other proteins, and which have less than 4 or more contiguous amino acids identical to the comparative protein sequences, are selected for use as immunogens and are the peptides for which composition claims are made. The resulting antibody reagents are then tested for reactivities to antigens in sera of persons with particular disease states related to the initial selected (target) protein(s), and compared to reactivities of sera of a control group. Obviously, those reacting with antigens in the particular disease state and not with controls can then be studied for utility as diagnostic reagents or as therapeutic agents. Examples are given and the data therein clearly support the invention idea and the utility. The invention, in my opinion, is consistent with the claims: peptide sequences of particular utility and the compositions of those selected and tested peptides.

c. The examiner states (under number 102) that Regenmortel teaches the method of identifying peptide epitopes using in the first steps the algorithm prediction programs. This is fine and is also used by Calenoff-Ditlow as discussed above. The examiner then says that Regenmortel teaches the functional, and to varying degrees the sequence homologies, of mimotopes. The examiner then equates the mimotope peptide (number 13) to a peptide sequence selected by the method of Calenoff-Ditlow because of points (a) through (f) as listed by the examiner.

Reasons why this is not a correct interpretation or correlation to the Calenoff-Ditlow method:

- 1) The mimotope is **not** derived from the protein HbsAg sequence 120-132 as the examiner states (point b), therefore no predetermined link exists between the mimotope sequence and the target protein. Rather, the mimotope is derived from the peptide library and may have certain sequence homology to the HbsAg sequence for the reasons discussed above. However, the mimotope is an entirely different entity from either the target protein or the comparative proteins, or the peptides described in Calenoff-Ditlow. Thus it is incorrect to assign any equivalence of fact or inference.

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- 2) A mimotope is **not** an immunogenic peptide equivalent to those used by Calenoff-Ditlow. Immunogenic means that the peptide has been demonstrated to elicit an immunologic response, cell-mediated or antibody. Again, the mimotopes are derived from a peptide library and were not used as immunogens in the examples of the Regenmortel paper. In Calenoff-Ditlow, the identified peptide sequences of the target proteins are used as immunogens.
- 3) The HCV protein of Figure 4 of Regenmortel could be used as a comparative protein as the examiner states. However, the examiner has taken this example out of the context of the Regenmortel paper, and as would be generally used by immunologists (and as used by Calenoff-Ditlow). It is true that the HCV sequence 20-32 shows no homology to the HbsAg sequence 120-132 as the examiner states. However, as used by Regenmortel, this is simply an additional example of a protein antigenic sequence for which a mimotope was identified, ie, the mimotope P551c. In contrast, parts of the invention steps of Calenoff-Ditlow are to compare the PSP sequences to **all other known protein sequences and then to select those PSP sequences of less than 50% homology and less than 4 contiguous amino acid sequences**. This is quite different and bears no relationship to the fact that the various peptide sequences in Figure 4 of Regenmortel do not exhibit any or little homology of sequences.
- 4) The conclusion of the examiner is that the "Regenmortel's reference anticipated the current invention." I do not believe there is a single immunologist who works with peptide – protein antigens and epitopes who would agree with the latter conclusion. As stated above, the invention of Calenoff-Ditlow is the peptide selection method and the compositions of the peptides selected by those methods – both the methods and the peptides of Calenoff-Ditlow are neither described nor hinted at in the Regenmortel paper.

d. Under claim rejections – 35 USC number 103, part 3:

The examiner rejects claims 18-19 because:

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"Regenmortel teaches using recombinant technology ----- to synthesize peptides capable of producing immunogenicity ---." Any peptide, including mimotope peptides, could potentially be used as immunogens, as the examiner states, by coupling to a carrier molecule to enhance immunogenicity. However, as pointed out above, it is incorrect to use the mimotope example in Regenmortel, or in any other way by anyone, in comparison or in relation to the identified peptide sequences from the target proteins as described by Calenoff-Ditlow. Thus, the premise used by the examiner is incorrect.

- e. Under part 4: The examiner rejects claim 22 using the example of IL-2 to induce immune tolerance to specific respiratory antigens. IL-2 is a protein with defined biologic activities including the example cited by the examiner. The PSP sequences selected by the invention of Calenoff-Ditlow are peptides and a part of a protein, the target protein. One cannot equate the protein and peptides of the Tu et al. reference and the Calenoff-Ditlow patent application; the protein and peptides are quite different entities, both as they are defined, and as they exist structurally - IL-2 has a defined 3D secondary and tertiary structure whereas Calenoff-Ditlow peptides, as free peptides or as conjugated to a carrier molecule, will more likely exhibit multiple secondary structures over any time interval (such peptides would be termed to have "random" structure).

Finally, I am unaware of any previous work or reports other than Calenoff-Ditlow of the invention disclosed in the patent application captioned above. I believe the patent application captioned above discloses an invention that is a contribution to the field of immunology.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully Submitted,


Byron AndersonDate: 7/16/04

CURRICULUM VITAE

Byron E. Anderson

Date of Birth: December 30, 1941; Hammond,
Indiana

Education:

B.A. 1963 Kalamazoo College, Kalamazoo,
Michigan;

Chemistry and Biology

Ph.D. 1968 University of Michigan, Ann Arbor,
Michigan; Biochemistry; also
student at John Hopkins
University, Baltimore, Maryland
1966-1968.

Thesis Advisor: Dr. Saul Roseman

Positions Held:

Postdoctoral Fellow - 1968-1971, Columbia University,
College of Physicians and Surgeons, New York, New York.
Advisor: Dr. Elvin A. Kabat.

Assistant Professor, Departments of Biochemistry, and
Otolaryngology and Maxillofacial Surgery, Northwestern
University Medical School, 1971-1977.

Associate Professor, Departments of Biochemistry, and
Otolaryngology and Maxillofacial Surgery, Northwestern
University Medical School, 1977-1982.

Associate Professor, Department of Molecular Biology and
Biochemistry Program 1982-1984.

Professor, Departments of Molecular Biology, and
Otolaryngology and Head and Neck Surgery, Northwestern
University Medical School, 1984-1989.

Professor, Departments of Cell and Molecular Biology,
and Otolaryngology and Head and Neck Surgery, Northwestern
University Medical School, 1989-present.

Professor, Department of Urology, 1995 - present.

Member, Cancer Center, 1975 -

Member, Arthritis Research Program, 1976 - ; Multipurpose Arthritis Center, 1983 -

Member, Tumor Cell Biology Program, 1979 -

Member, Interdisciplinary Program in Molecular, Cellular and Integrative Biomedical Sciences, 1983 - 1990.

Member, Molecular and Cellular Biology Training Program, 1983 -

Member, Medical Scientist Training Program, 1985 -

Member, Biotechnology Training Program, 1993 -

Honors and Fellowships:

1974-1979, Research Career Development Awardee of NIH (NIAMDD)

1973-1974, Senior Investigator of the Arthritis Foundation

1968-1971, Postdoctoral Fellow of the Helen Hay Whitney Foundation and the National Cystic Fibrosis Research Foundation

1963-1968, United States Public Health Service Trainee

1963, summer National Science Foundation Undergraduate Trainee

Professional Societies and Activities:

American Association for the Advancement of Science

American Society of Biochemistry and Molecular Biology

American Association of Immunologists

International Society for Oncodevelopmental Biology and Medicine

Society for Complex Carbohydrates

American College of Rheumatology

International Society for Artificial Organs

The Protein Society

Advisor or Consultant to a number of biotechnology companies: Sangtec Medical, Fresenius, Abbott Labs., Chugai Pharm. LTD, Vivex Therapeutics, Inc., Carbohydrates Int., Toagosei Pharm.

Students:

| | |
|-------------------------------|------|
| Celia Kaye, Ph.D., | 1976 |
| Linda Hanson, M.S., | 1976 |
| Margaret Steffes, M.S., | 1977 |
| Lorraine Gill, Ph.D., | 1977 |
| Tod Sloan, Ph.D. | 1979 |
| John Jay Weiss, M.S., | 1979 |
| Lyman Davis, M.S., | 1980 |
| Mark Pankow, M.S., | 1983 |
| Lyman Davis, Ph.D. | 1984 |
| Ruth Entiwstle, Ph.D., | 1986 |
| John Jay Weiss, Ph.D., | 1986 |
| Mark Pankow, Ph.D., | 1988 |
| Michael Baumann, Ph.D., | 1990 |
| Michael Shields, Ph.D., | 1991 |
| John J. Kresl, Ph.D., | 1992 |
| Marilyn Brown, Ph.D., | 1992 |
| Winnie Pao, M.S. | 1993 |
| NaMi Cho, M.S., | 1994 |
| Joseph Orlando, M.S., | 1994 |
| Sanjiv Gupta, M.S., | 1994 |
| Katherine Worthington, Ph.D., | 1994 |
| Jai Syn, M.S., | 1995 |
| Cristopher Olenec, M.S. | 1995 |
| Lora Tucker-Garcia, M.S. | 1995 |
| Uri Ratner, M.S. | 1996 |
| Christina Stadler, M.S. | 1996 |
| Lora Kastrup, M.S. | 1996 |
| Marsha Yoder, M.S. | 1997 |
| Jasbir Kindra, M.S. | 1997 |
| Sharon Doering, M.S. | 1997 |
| Clara Smith, M.S. | 1998 |
| Ethan Buckley, M.S. | 1999 |
| Scott Rosenblum, M.S. | 2000 |
| Nancy Sullivan, M.S. | 2000 |
| Jeffery Black, M.S. | 2000 |

Trainees:**Postdoctoral Fellows:**

| | |
|----------------|-----------------|
| Deepika Paul | Mario Venegas |
| Samar Makloutf | Thomas Rohr |
| Jitendra Verma | Michio Tanaka |
| Shiva Motameni | Stewart Nelson |
| Lyman Davis | Ramendra Pandey |
| Bernard Kubak | Donna Bishop |

Residents in Rheumatology:

| | |
|-------------------|-------------------|
| Mike Repice | Albert Iammartino |
| Charlotte Harris | William Liu |
| Cynthia Gustafson | |

Residents in Otolaryngology:

| | |
|---------------|------------|
| Deyan Popovic | Susan Lyon |
|---------------|------------|

Medical Students:

| | | | |
|-----------------|----------------|-----------------|--------------|
| James Carr | Robert Sobut | Denise Mistro | Susan Roth |
| Thomas Lucke | Sarah Keesara | Ragu Thunga | Thomas Walsh |
| Thomas Henthorn | Paul Lyon | Martin Radvany | Ateet Shah |
| Tapubrata Ghosh | Annette Barns | James Misak | Ripal Ghandi |
| Roberta Gausas | Reeva Shulruf | Samir Taneja | |
| William Walsh | Kyle ver Steeg | Sylvester Black | |

Biotechnology Program Students:

| | | |
|-----------------|--------------------|----------------|
| Winnie Pao | Cristina Stadler | Marcia Yoder |
| Ayano Takamoto | Christopher Olenec | Jasbir Kindra |
| Lourdes Bermejo | Jai Syn | Joseph Orlando |
| Uri Ratner | Nami Cho | Lora Kastrup |
| Sanjiv Gupta | Sharon Doering | Clara Smith |
| Ethan Buckley | Scott Rosenblum | Nancy Sullivan |
| Jeffrey Black | | |

Undergraduate Students:

| | | |
|------------------|----------------|-----------------|
| Marlene Morrison | Loretta Liu | Jennifer Shaw |
| Daniel Fryxell | John Zachariah | Jason Roh |
| Michael Baumann | Denise Mistro | Andrew Hong |
| Ragu Thunga | Askok Kukadia | Kirsten Stadler |
| Martin Radvany | Gautham Reddy | SandyShaw |
| Andrew Radvany | Stéphanie Wu | Katherine Chen |
| Daniel Roh | David Napochi | Thomas Kim |

Students, Thesis, Present Position

Celia Kaye, M.D., Ph.D.

Cystine Reduction and Transport in Cystinotic and Normal Fibroblasts

Ph.D., Biochemistry, 1985

Head, Genetics, U. of Texas, San Antonio

Linda Hanson, M.S.

Characteristics of the Antigenic Reactivities of Rheumatoid Arthritic Synovial Fibroblasts

M.S., Clinical Pathology, 1976

Lorraine Gill, Ph.D.

Characterization of Reactivities of Anti-Cellular Sera with Tumor Cells in Vitro

Ph.D., Biochemistry, 1977

Research Scientist, New England Nuclear

Margaret Lu Steffes, M.S.

Delineation and Partial Characterization of an Associated Rheumatoid Arthritic Reactive Antigen

M.S. Biochemistry, 1977

Senior Manager, Abbott Labs

Tod B. Sloan, M.D., Ph.D.

A Study of Synovial Cell Antigens

Ph.D., Biochemistry, 1978

Associate Professor, Dept. Anesthesiology, U. of Texas, San Antonio

John Jay Weiss, M.S., Ph.D.

Studies on the Platelet Derived Connective Tissue Activating Peptide

M.S., Clinical Pathology, 1979

Program Director in Allergy, Diagnostic Products Corp.

Lyman E. Davis, M.S., Ph.D.

Immunoassays for Fibronectin

M.S., Clinical Pathology, 1980

Senior Director, Takeda Abbott

Mark L. Pankow, M.S., Ph.D.

Immunochemical Staining of Cancer Tissues

M.S., Clinical Pathology, 1983

Director of R&D, Parke DeWatt Labs

Students, Thesis, Present Position - continued

Lyman E. Davis, M.S., Ph.D.

Specificities of Antibodies to a Carbodiimide and to the Amino-Terminus of a Platelet Mitogen

Ph.D., Tumor Cell Biology, 1984

Senior Director, Takeda Abbott

Ruth A. Entwistle, Ph.D.

A Kinetic Study of Fibronectin and the Clq Component of Complement Ph.D.,

Tumor Cell Biology, 1986

Research Associate, Washington U. School of Medicine

Mark L. Pankow, M.S., Ph.D.

Development of an Assay for Detection of Galactose Terminated Glycoproteins in Biologic Fluids

Ph.D., Tumor Cell Biology, 1988

Director of R&D, Parke DeWitt Labs.

John Jay Weiss, M.S., Ph.D.

Studies of Complement Mediated Interactions Between Fibronectin and Immune Complexes

Ph.D., Tumor Cell Biology, 1989

Program Director in Allergy, Diagnostic Products Corp.

Michael A. Baumann, Ph.D.

Synthetic Peptides with Immune Complex Binding Activity

Ph.D., Tumor Cell Biology, 1990

Research Scientist, Abbott Labs.

Michael J. Shields, Ph.D.

Characterization and Use of Monoclonal and Polyclonal Antibodies

Directed Against C-Reactive Protein in the Fluid and Solid Phase

Detection of Altered Forms of C-Reactive Protein in Humans

Ph.D., Molecular Biology, 1991

Postdoctoral Fellow, National Institutes of Health

Students, Thesis, Present Position - continued

John Joseph Kresl, Ph.D., M.D.

Evaluation of Native Modified Human C-Reactive Protein
Interconversion: Possible Role for Modified C-Reactive
Proteins in Tumor Inhibition

Ph.D., Tumor Cell Biology, 1992, MD, 1993

Staff Physician, Radiation Oncology, St. Mary's
Hospital, Phoenix,

Marilyn R. Brown, Ph.D.

Receptor-Ligand Interactions Between Serum Amyloid P
Component

and Model Soluble Immune Complexes

Ph.D., Tumor Cell Biology, 1993

Research Scientist, Baxter Labs.

Winnie Pao, M.S.

Autoantibodies in Colon Cancer

M.S., Biotechnology Program, 1993

Research Associate, Division of Transplantation, NUMS

Katherine Worthington, Ph.D.

Design of Peptides Binding to Beta-2-microglobulin and
Immunoglobulin G

Ph.D., Tumor Cell Biology, 1994

Research Analyst, Research Corp. Technologies

NaMi Cho, M.S.

Binding of IgG Aggregates to CBP2-Amino Link

M.S., Biotechnology Program, 1994

Postdoctoral Fellow, Boston University

Joseph Orlando, M.S.

CBP2 Binding of Aggregated-IgG

M.S., Biotechnology Program, 1994

Graduate Student, Dept. of Microbiology-Immunology,

Wake Forest University, Bowman Gray School of Medicine

Sanjiv Gupta, M.S.

Detection of a Transferrin Isoform Associated with Alcohol
Consumption

M.S., Biotechnology Program, 1994

Medical Student, University of Indiana

Students, Thesis, Present Position - continued

Jai Syn, M.S.

Specificities of Binding of Lectins to an Aromatic Carbohydrate Mimetic Library

M.S., Biotechnology Program, 1995

Research Associate, Abbott Labs.

Christopher Olenec, M.S.

Binding of Proteins to a Secondary Structure Limited Peptide Library

M.S. Biotechnology Program, 1995.

U.S. Commerce Dept. on FDA Regulations, Washington, D.C.

Lora Tucker-Garcia, M.S.

Carbohydrate Deficient Glycoproteins: Significance in Carbohydrate Deficient Glycoprotein Syndrome, Alcoholism, and Fetal Alcohol Syndrome

M.S., Biotechnology Program, 1996

Research Associate, Abbott Labs.

Uri Ratner

Characterization of Xenoreactive Antibodies Important in Transplant Rejection

M.S. Biotechnology program, 1996

Research Analyst, Venture One

Cristina Stadler

Complement Inhibition by Peptides in Hyperacute Rejection Reactions

M.S., Biotechnology Program, 1996

Division Manager, Baxter Labs.

Lora Kastrup

Study of Vaginal Fluid Oligosaccharides in UTIs

M.S., Biotechnology Program, 1996

Research Associate, Baxter Healthcare Corporation

Jasbir Kindra, M.S., LL.D.

Complement Inhibition Through the Use of Diaromatic Peptides to Allow Xenotransplantation

M.S., Biotechnology Program, 1997

Patent Attorney, Green Bay, WI

Students, Thesis, Present Position

Marcia Yoder, M.S.

Studies on Complement Inhibition by a Diaromatic Peptide,
Tryptophan-Tyrosine

M.S., Biotechnology Program, 1997

Research Associate, Eli Lilly Co.

Sharon Doering, M.S.

Avian IgY antibodies - Use in Xenotransplantation

M.S., Biotechnology Program, 1997

Biotechnology Analyst, Madison Securities

Clara Smith, M.S.

Cross-Linked Avian IgY and Human IgG as Potential
Inhibitors of Rejection in Xenotransplantation

M.S., Biotechnology Program, 1998

Research Scientist, Glaxo Welcome

Committee Service:

Research Committee, Medical and Dental Schools
Sigma XI Symposia
Medical Applicant Interview
 Cancer Center Library
General Services Committee of Faculty Senate
Faculty Senate
Biochemistry Workshop
Departmental Outside Speaker, Equipment, Library
Graduate Affairs Committee
VA Research Development Committee
Executive Committee of the Biochemistry Program
Cancer Center Equipment
Cancer Focus
Medical Admissions
Tumor Cell Biology Program
Comprehensive Examination
Pre-Thesis and Thesis Committees for 33 students
University Research Grants Committee
General Faculty Committee
Graduate Professional Education of the Physician
Task Force on the Future of the Medical Library
Microbiology Department Review Committee
Medical Senate Council
Medical Council
Medical Library Long-Range Planning Committee
Program Review of Microbiology-Immunology
Program Review of Physical Therapy Curriculum
Research Program Committee on Immunobiology
Intellectual Property Committee
Medical School Urology Chair Search Committee
Medical School Division Making Course Development
Committee
 Medical School Research Council
 Biotechnology Program: Executive Committee,
Admissions,
 Advisory Board
Honors Program in Medical Education
Program Review Committee - Mol. Pharm. & Biochem.

**Committee Service 1984 -
University:**

General Faculty Committee, 1982-1985
Subcommittee on Benefits
Chair, GFC/Trustees Meeting, 1983, 1984
Intellectual Property Committee, 1989-1996
University Research Grants Committee, 1973 - 1976;
1995 -
Biotechnology Program: Executive Committee, Admissions,
Advisory Board, 1992 -

Medical School:

Medical Senate Council, 1984-1988
General Profession Education of the Physician
Committee
Chair, Subcommittee on Faculty Involvement, 1985-1986
Research Long-Range Planning in Immunobiology, 1985-
1986
Chair, Research Program Committee on Immunobiology,
1985- 1990
Medical School Admissions, 1972 -
Honors Program in Medical Education, 1996 -

Departmental:

Appointments, Promotion, Tenure
Graduate Affairs
Course/Exam/Certificate - Chair
Promotions - Chair
Library
Recruitment - Chair

Teaching Service:

1. Medical, Biochemistry, laboratory section
Subjects: Statistics, acid-base balance, nutrition, automated analyses, topics in immunology and autoimmune diseases
2. Medical, Biochemistry, lecture
Topics: glycogen metabolism
mucopolysaccharides, saccharide interconversions
glycoproteins
hexose monophosphate pathway
post-ribosomal processing of proteins
3. Medical, biochemistry, lecture and independent study of immunology with students with proficiency in biochemistry
4. Medical, immunology, lectures on antibody structure and antibody - antigen interactions
5. Medical, basic oncology, lectures on biological membranes
6. Graduate, survey course in immunology
7. Graduate, lecture and seminar on biological membrane topics
8. Graduate, lectures in immunology on antibody structure, antigenic determinants, antibody-antigen interactions, antibody functions
9. Graduate, survey courses in biochemistry,
Topics: carbohydrate structure, analysis;
glycoprotein and glycolipid structure, functions and metabolism;
lipopolysaccharide structure and synthesis; biological membranes; muscle structure
protein structure
protein - ligand binding

enzyme mechanisms
enzyme kinetics

10. Graduate, basic oncology, lectures on biologic membranes
11. Graduate, survey course in immunochemistry
12. Post-Graduate, lecture on inter-relationships of complement, fibrinolytic and kinin systems

LECTURES, MEDICAL BIOCHEMISTRY

1. Glycogen metabolism and regulation
2. Structural complementarily, amplification of metabolic response, disorders in glycogen metabolism
3. Galactose, glucuronic acid metabolism, mucopolysaccharides, saccharide interconversions, hexose monophosphate shunt
4. Post-ribosomal modification of proteins, protein polymorphisms and disease consequences
5. Fatty acid synthesis and degradation
6. Lipid structure and function
7. Phospholipid structure and function

BASIC ONCOLOGY:

1. Structural features of biologic membranes
2. Tumor cell membranes, tumor-associated antigens

GRADUATE BIOCHEMISTRY:

1. Stereochemistry of carbohydrates
2. Conformations of carbohydrates
3. Chemical reactivity and conformation
4. Methodology for structural determinations of carbohydrate sequences
5. Types and characteristics of complex carbohydrates
6. Methods applied to analysis of complex carbohydrates
7. Synthesis of complex carbohydrates
8. Functions of complex carbohydrates
9. Proteins - primary and secondary structure
10. Proteins - Tertiary and quaternary structure
11. Protein-protein and protein-ligand interactions
12. Proteins - structural predictions
13. Enzyme kinetics
14. Enzyme mechanisms
15. Enzymes - Types and regulation

16. Membrane structure and function
17. DNA and RNA structures
18. Principles that determine polynucleotide structure
19. Protein - polynucleotide interactions

LECTURES, DENTAL BIOCHEMISTRY

1. Glycogen metabolism and regulation of blood glucose
2. Structure and function of phospholipids, membrane structure
3. Fatty acid synthesis and degradation
4. Interrelationships and regulation of metabolic pathways

IMMUNOCHEMISTRY:

1. Heterogeneity of the antibody response; classes, subclasses, allo- and idiotypes of Igs
2. Structural features of Igs; discussion of homologies and deduction of structure from amino acid sequence data
3. Effector functions of the Igs
4. Three dimensional structure of Igs and quaternary interactions of domains
5. Antibody combining site constructs
6. Antibody combining site interactions with haptens; serologic specificities
7. Measurement, interpretation and quantitations of antibody-antigen interactions
8. Kinetic analyses of antibody-hapten interactions
9. Radio- and enzyme-immunoassays
10. Parameters of antigenicity and immunogenicity

CANCER PHARMACOLOGY:

1. Progression and selection of tumor cell populations; changes in cell surface composition and interactions with metastases
2. Tumor-associated antigens

RESIDENT AND STAFF LECTURES:

Otolaryngology: lectures on overview of tumor immunology

- Rheumatology:
1. Synovial cell metabolism and antigen, genetic analysis of antigen expression
 2. Protein Polymorphisms: types, effects on protein function, contribution to disease processes

Subjects taught in Medical Biochemistry Laboratory:

1. Principles and methods of automated analyses
2. Acid-base regulation and imbalances
3. Statistical methods and analyses of clinical data
4. Dietary calculations of protein, carbohydrate, lipid, caloric intake and nitrogen balance
5. Presentations, analysis, critique of primary clinical and basic research papers

Current Teaching:

Lectures in graduate biochemistry: Characterizations

of proteins, protein secondary, tertiary and quaternary structures, predictions of protein and peptide structures, binding site interactions of proteins with various ligands, structures of polynucleotides, chemistry, stereochemistry and conformations of carbohydrates, structural types of complex carbohydrates, complex carbohydrate biosynthesis, functions of complex carbohydrates.

Lectures in medical and dental biochemistry: on carbohydrate, lipid and phospholipid structure and function, glycogen metabolism and regulation of blood glucose, fatty acid synthesis and degradation, and integration and regulation of carbohydrate and lipid metabolism.

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Rovis, L., Anderson, B. and Kabat, E.A., "Immunochemical Studies on Blood Group A, B, H, Le^a and Le^b and Precursor I Substances," in Methodologie de la Structure et du

Metabolism des Glycoconjuges, 645-650, 1974.

Enzyme Kinetic Studies

Abstract: Anderson, R. and Czerlinski, G., "Enzyme Amplification for the Detection of Very Low Levels of Substrate Concentration," Biophysical Society, San Francisco, CA, Feb., 1986.

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I Blood Group Antigens

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Kim, T. and Anderson, B., "Isolation and Characterization of Human Anti-alphaGal Antibodies," Am. Soc. Adv. Sci., Am. Jun. Acad. Sci., Washington, D.C., Feb., 2000.

Fryer, J. P., Firca, J., Leventhal, J. R., Blondin, B., Malcolm, A., Ivancic, D., Gandhi, R., Shah, A., Pao, W., Abecassis, M., Kaufman, D. B., Stuart, F. and Anderson, B. E., IgY Anti-Porcine Endothelial Cell Antibodies Effectively Block Human Anti-Porcine Xenoantibody Binding, "Xenotransplantation, 56, 98 - 109, 1999.

Fryer, J. P., Leventhal, J. R., Pao, W., Stadler, C., Jones, M., Walsh, T., Zhong, R., Zhang, Z., Wang, H., Goodman, D. J., Kurek, M., d'Apice, A. J. F., Blondin, B., Ivancic, D., Buckingham, F., Kaufman, D., Abecassis, M., Stuart, F. and Anderson, B. E., "Synthetic Peptides which Inhibit the Interaction between C1q and Immunoglobulin and Prolong Graft Survival," Transplantation, 70 828 -836, 2000.

Walsh, W.E., Anderson, B. E., Ivancic, D., Zhang, Z., Paccini, J. P., Rodgers, T. G., Pao, W. and Fryer, J. P., "Distribution of and Immune Response to Chicken anti-alphaGal Immunoglobulin Y Antibodies in Wild-Type and alphaGal Knockout Mice," Immunology, 101, 1 - 11, 2000.

Cook, C. L., Pao, W., Firca, J. R., Anderson, B. E. and Fryer, J. P., "Simple Purification Methods for alphaGalactose-Specific Antibody from Chicken Eggs," J. Biosci. & Bioeng., 91, 305 - 310, 2001.

Other Studies

Carruthers, M. and Anderson, B., "Inhibition by Polyanions of *Vibrio Parahaemolyticus* Adherence: A Physiochemical Effect", J. Inf. Dis., 140, 119-122, 1979.

Jemmerson, R., Kaplan, B., Denton, M.D., Anderas, P., Anderson, B. and Margoliash, E., "Six Related Protein Products from a Single Patient with Multiple Myeloma," Biochemistry, 18, 4676-4683, 1979.

Anderson, B., Donakowski, C., Entwistle, R. and Davis, L., "Reisolation of Immunoreactive Radioiodinated Antigens Using Glutaraldehyde-Insolubilized Antibody Preparations," J. Immunological Methods, 36, 309-314, 1980.

Davis, L.E., Roth, S.A. and Anderson, B., "Antisera Specificities to 1-Ethyl-3-(3-Dimethylaminopropyl) Carbodiimide Adducts of Proteins," Immunology, 53, 435-441, 1984.

Abstract: Cohen, I., Drisdell, R.C. and Anderson, B., "Factor XIII-Catalyzed Polymeric Assemblies in Platelets," 32nd Meeting of the International Committee on Thrombosis and Hematology, Jerusalem, June, 1986.

Pandey, R., Davis, L.E., Anderson, B. and Hollenberg, P.F., "Photoaffinity Labeling of Primary Aromatic Amines to Carrier Proteins to Elicit Antibody Response Against the Amine Haptens," J. Immunol. Methods, 94, 237-246, 1986.

Cohen, J. and Anderson, B. "Immunochemical Characterization of Transglutaminase-Catalyzed Polymers of Activated Platelets," Thromb. Res., 47, 409-416, 1987.

Abstract: Koch, A.E., Burrows, J.C., Marder, R., Damer, P., Anderson, B. and Leibovich, S.J., "Preliminary Characterization of Monocyte/Macrophage (mo) Heterogeneity using Monoclonal Antibodies Generated to U937 Cells and Human Rheumatoid (RA) Tissue Synovial Macrophages," 4th International Conference on Leukocyte Differentiation Antigens, Tissue Antigens, 33, 205 1988.

Other Studies - continued

Abstract: Koch, A.E., Burrows, J.C., Marder, R., Domer, P., Anderson, B. and Leibovich, S.J., "Monocyte/Macrophage (mo/mo) Heterogeneity Defined by a Panel of Monoclonal Antibodies Produced to Rheumatoid (RA) Synovial Tissue Mo," American Federation for Clinical Research, Clin. Res., 37, 413A, 1989.

Abstract: Kim, J.G., Miller, M.M., Anderson, B., Rebar, R.W. and LaBarbera, A.R., "Anti-Ovarian Antibody Titers Correlate with Serum FSH Concentrations in Experimentally Induced Ovarian Failure," Soc. Gynecologic Investigation, March, 1989.

Clark, C.R., Kresl, J.J., Hines, K.K. and Anderson, B.E., "An Immunofiltration Apparatus for Accelerating the Visualization of Antigen on Membrane Supports," Anal. Biochem., 228, 232-237, 1995.

Abstract: Kim, J.G., Anderson, B.E., Rebar, R.W. and LaBarbera, A.R., "Determination by ELISA of Anti-ovarian Antibodies in Premature Ovarian Failure," Am. Fertility Soc., Nov., 1989.

Abstract: Pankow, M.L., Cane, R. and Anderson, B., "Development of Enzyme-Linked Lectin Assay for the Detection and Quantitation of Desialylated Serum Glycoproteins," Fed. Proc., 45, 3359, 1986.

Abstract: Pankow, M.L., Cane, R. and Anderson, B., "Quantitation in Sera of Desialylated Glycoproteins using an Antibody and Lectin Sandwich Assay," Soc. Complex Carbohydrates, Charleston, S. C., Nov. 1986.

Abstract: Clark, C., Kresl, J., Hines, K., Anderson, B. and Mallia, A.K., "An Apparatus for Rapid Detection of Western and Dot-Blotted Proteins," FASEB J., 5, A913, 1991.

Abstract: Davis, L., Jokinen, D., Turk, L., Radvany, M., Theophilus, A., Fitzsimons, E. and Anderson, B., "Immunoassays for Hemoglobin Alc Employing Antibodies Directed to a Reductively Modified Peptide Immunogen." FASEB J., 5, A913, 1991.

Other Studies - continued

Koch, A.E., Burrows, J.C., Marder, R., Domer, P., Anderson, B. and Leibovich, S.J., "Monoclonal Antibodies Detecting Monocyte/Macrophage Activation and Differentiation Antigens and Identifying Functionally Distinct Subpopulations of Human Rheumatoid Synovial Tissue Macrophages," Am. J. Path., 138, 165-173, 1991.

Kim, J.G., Anderson, B.E., Reban, R.W. and LaBarbera, A.R., "A Biotin-Streptavidin Enzyme Immunoassay for Detection of Antibodies to Porcine Granulosa Cell Antigens," J. Immunoassay, 12, 447-464, 1991.

Abstract: Holloran, M.M., Haskell, C.J., Carley, W., Shah, M.R., Anderson, B. and Koch, A.E., "4All: A Cytokine-Inducible Endothelial Antigen," J. Invest. Med., 43, 335A, 1995.

Clark, C.R., Kresl, J.J., Hines, K.K. and Anderson, B.E., "An Immunofiltration Apparatus for Accelerating the Visualization of Antigen on Membrane Supports," Anal. Biochem., 228, 232-237, 1995.

Woods, J. M., Campbell, P. L., Polverini, P. J., Anderson, B. and Koch, A. E., "The Soluble 4A11 Antigen is Angiogenic in vivo and is Upregulated in Rheumatoid Arthritis Compared to Osteoarthritis Synovial Fluid and Serum, submitted for review.

Abstract: Woods, J. M., Campbell, P. L., Polverini, P. J., Anderson, B. E. and Koch, A. E., "The Soluble 4A11 Antigen is Angiogenic in vivo and is Upregulated in Rheumatoid Arthritis Compared to Osteoarthritis Synovial Fluid and Serum," Assoc. Clin. Res. Mtg, Nov., 1997, Washington, D.C.

Abstract: Woods, J. M., Campbell, P. L., Polverini, P. J., Anderson, B. E. and Koch, A. E., "The Soluble 4A11 Antigen is Angiogenic in vivo and is Upregulated in Rheumatoid Arthritis Compared to Osteoarthritis Synovial Fluid and Serum," Am. Fed. Med. Res., April, 1998, J. Inv. Med., 46, 233A, 1998.

PATENT APPLICATIONS

1. Binding of immune complexes by modified forms of c-reactive protein.

Applicants: Northwestern University and
Rush - Presbyterian - St. Luke's Medical Center

Inventors: Potempa and Anderson

U.S. application Serial No. 07/582,884,

Filed: October 3, 1990

Refiled: 08/271,137; July 6, 1994 - 2545/73

Status: Issued: January 14, 1997; US Letter

Patent No. 5,593,897

PCT application number PCT/US89/01247

Filed March 31, 1989 (2545/11)

Status: Nationalized

Australian application no. 34485/89

Filed: March 31, 1989 (2545/24)

Status: Issued, 6/11/93; Serial #633488

Japanese application No. 1-504716

Filed: March 31, 1989 (2545/26)

Status: Pending, awaiting examination

Canadian application No. 595,543

Filed April 3, 1989 (2545/10)

Status: Pending, no action yet

EPO application No. 89904944.9

Filed March 31, 1989 (2545/25)

2. A synthetic peptide and its uses

Applicant: Northwestern University

Inventors: Baumann and Anderson

U.S. application Serial No. 07/598,416

Filed: October 16, 1990 (2545/28)

Status: Issued November 15, 1994

Patent Number 5,364,930

PCT application number PCT/US91/07581

Filed: October 9, 1991

Status: Pending

PATENT APPLICATIONS- continued

3. Binding of aggregated immunoglobulin or immune complexes by serum amyloid P component

Applicant: Northwestern University

Inventors: Anderson and Brown

U.S. application Serial No. 07/672,526

Filed: March 19, 1991 (2545/21)

Status: Issued 6/22/93, P-5,221,628

4. Immunoassay for glycosylated proteins employing antibody to reductively glycosylated amino acids

Applicant: Northwestern University

Inventors: Davis and Anderson

U.S. application Serial No. 07/397,781
(2545/5)

08/068,525 (5/27/93) (2545/51)

08/151,073 (11/12/93) (2545/52)

Filed: August 23, 1989

Status: Granted; U.S. Letters Patent No.
5,484,735

PCT application no. PCT/US90/04666

Filed: August 17, 1990 (2545/23)

Status: Nationalized

EPO application no. 90913261.5

Filed: August 17, 1990 (2545/37)

Status: Granted

Japanese application no. 2-512516

Filed: August 17, 1990 (2545/38)

Status: Pending, awaiting examination

PATENT APPLICATIONS- continued.

5. Immunoassay for detecting and monitoring alcoholics
Applicants: Northwestern University and Immtech Int.
Inc.
Inventors: Makhlouf, Pankow, Anderson and Bean
U.S. application Serial No. 07/765,169;
Filed: September 25, 1991 (2545/8)
08/272,852; July 08, 1994 (2545/74)
Status: granted

PCT application Serial No. PCT/US92/08136
Filed: September 25, 1992 (2545/44)
Status: Nationalized

EPO application no. 92921176.1
Filed: August 25, 1992 (2545/60), granted

Japanese application no. 5-506376
Filed: 9/25/92 (2545/61)

Canadian application no. 2119651
Filed: 9/25/92 (2545/59), granted

Australian application no. 27577/92
Filed 9/23/92 (2545/58), granted
6. Methods of Treating Cancer Using Modified C-Reactive Protein
Applicants: Northwestern University and Immtech Int.
Inc.
Inventors: Potempa, Kresl and Anderson
U.S. application Serial No. 07/874,263
Filed: April 24, 1992
Status: Issued December 12, 1995
US Letters Patent No. 5,474,904
PCT application no. PCT/US/03769
Filed: 4/22/92 (2545/50)
Status: Nationalized
EPO application no. 93910710.8, Filed: 4/22/93
(2545/81)

Japanese application no.5-518361, Filed: 4/22/93
(2545/80)

Canadian application no. 2432001, Filed: 4/22/93
(2545/80)

Australian application no. 41109/93,
Filed: 4/22/93 (2545/79)

PATENT APPLICATIONS- continued

7. Method of detecting cancer
Applicants: Northwestern University and Immtech Int. Inc.
Inventors: Anderson and Davis
U.S. application Serial No. 07/939,830
Filed: September 3, 1992 (2545/9)
Status: Issued December 27, 1994
Patent Number 5,376,531

Japanese application No. 4-293052
Filed: October 30, 1992 (2545/45)
Status: Pending
8. Methods of Imaging Cancer Cells Using Modified C-Reactive Protein
Applicant: Northwestern University
Inventors: Potempa, Kresl and Anderson
U.S. Application 149,663
Filed Nov. 9, 1993
Status: Issued December 12, 1995
US Letters Patent No. 5,474,904
9. CIP to Synthetic Clq Peptide Fragments - use in transplantation
Applicant: Northwestern University
Inventors: Baumann, Anderson and Fryer
Filed: April 6, 1996 to US patent office
Status: granted

PCT of same:
Application and Inventors: Baumann, Anderson and Fryer
Filed: April 4, 1997
Status: withdrawn
10. Method of Inhibiting Complement
Applicants and Inventors: Anderson and Fryer
Filed: April 14, 1997 to US patent office
Status: granted
11. Peptides Comprising Aromatic D-Amino Acids and Methods Of Use
Inventor: Byron E. Anderson
US patent filed July 3, 2002
PCT application filed July 3, 2003

CURRICULUM VITAE

Byron E. Anderson

Date of Birth: December 30, 1941; Hammond,
Indiana

Education:

B.A. 1963 Kalamazoo College, Kalamazoo,
Michigan;
Chemistry and Biology

Ph.D. 1968 University of Michigan, Ann Arbor,
Michigan; Biochemistry; also
student at John Hopkins
University, Baltimore, Maryland
1966-1968.
Thesis Advisor: Dr. Saul Roseman

Positions Held:

Postdoctoral Fellow - 1968-1971, Columbia University,
College of Physicians and Surgeons, New York, New York.
Advisor: Dr. Elvin A. Kabat.

Assistant Professor, Departments of Biochemistry, and
Otolaryngology and Maxillofacial Surgery, Northwestern
University Medical School, 1971-1977.

Associate Professor, Departments of Biochemistry, and
Otolaryngology and Maxillofacial Surgery, Northwestern
University Medical School, 1977-1982.

Associate Professor, Department of Molecular Biology and
Biochemistry Program 1982-1984.

Professor, Departments of Molecular Biology, and
Otolaryngology and Head and Neck Surgery, Northwestern
University Medical School, 1984-1989.

Professor, Departments of Cell and Molecular Biology,
and Otolaryngology and Head and Neck Surgery, Northwestern
University Medical School, 1989-present.

Professor, Department of Urology, 1995 - present.

Member, Cancer Center, 1975 -

Member, Arthritis Research Program, 1976 - ; Multipurpose Arthritis Center, 1983 -

Member, Tumor Cell Biology Program, 1979 -

Member, Interdisciplinary Program in Molecular, Cellular and Integrative Biomedical Sciences, 1983 - 1990.

Member, Molecular and Cellular Biology Training Program, 1983 -

Member, Medical Scientist Training Program, 1985 -

Member, Biotechnology Training Program, 1993 -

Honors and Fellowships:

1974-1979, Research Career Development Awardee of NIH (NIAMDD)

1973-1974, Senior Investigator of the Arthritis Foundation

1968-1971, Postdoctoral Fellow of the Helen Hay Whitney Foundation and the National Cystic Fibrosis Research Foundation

1963-1968, United States Public Health Service Trainee

1963, summer National Science Foundation Undergraduate Trainee

Professional Societies and Activities:

American Association for the Advancement of Science

American Society of Biochemistry and Molecular Biology

American Association of Immunologists

International Society for Oncodevelopmental Biology and Medicine

Society for Complex Carbohydrates

American College of Rheumatology

International Society for Artificial Organs

The Protein Society

Advisor or Consultant to a number of biotechnology companies: Sangtec Medical, Fresenius, Abbott Labs., Chugai Pharm. LTD, Vivex Therapeutics, Inc., Carbohydrates Int., Toagosei Pharm.

Students:

| | |
|-------------------------------|------|
| Celia Kaye, Ph.D., | 1976 |
| Linda Hanson, M.S., | 1976 |
| Margaret Steffes, M.S., | 1977 |
| Lorraine Gill, Ph.D., | 1977 |
| Tod Sloan, Ph.D. | 1979 |
| John Jay Weiss, M.S., | 1979 |
| Lyman Davis, M.S., | 1980 |
| Mark Pankow, M.S., | 1983 |
| Lyman Davis, Ph.D. | 1984 |
| Ruth Entiwstle, Ph.D., | 1986 |
| John Jay Weiss, Ph.D., | 1986 |
| Mark Pankow, Ph.D., | 1988 |
| Michael Baumann, Ph.D., | 1990 |
| Michael Shields, Ph.D., | 1991 |
| John J. Kresl, Ph.D., | 1992 |
| Marilyn Brown, Ph.D., | 1992 |
| Winnie Pao, M.S. | 1993 |
| NaMi Cho, M.S., | 1994 |
| Joseph Orlando, M.S., | 1994 |
| Sanjiv Gupta, M.S., | 1994 |
| Katherine Worthington, Ph.D., | 1994 |
| Jai Syn, M.S., | 1995 |
| Cristopher Olenec, M.S. | 1995 |
| Lora Tucker-Garcia, M.S. | 1995 |
| Uri Ratner, M.S. | 1996 |
| Christina Stadler, M.S. | 1996 |
| Lora Kastrup, M.S. | 1996 |
| Marsha Yoder, M.S. | 1997 |
| Jasbir Kindra, M.S. | 1997 |
| Sharon Doering, M.S. | 1997 |
| Clara Smith, M.S. | 1998 |
| Ethan Buckley, M.S. | 1999 |
| Scott Rosenblum, M.S. | 2000 |
| Nancy Sullivan, M.S. | 2000 |
| Jeffery Black, M.S. | 2000 |

Trainees:**Postdoctoral Fellows:**

| | |
|----------------|-----------------|
| Deepika Paul | Mario Venegas |
| Samar Maklouf | Thomas Rohr |
| Jitendra Verma | Michio Tanaka |
| Shiva Motameni | Stewart Nelson |
| Lyman Davis | Ramendra Pandey |
| Bernard Kubak | Donna Bishop |

Residents in Rheumatology:

| | |
|-------------------|-------------------|
| Mike Repice | Albert Iammartino |
| Charlotte Harris | William Liu |
| Cynthia Gustafson | |

Residents in Otolaryngology:

| | |
|---------------|------------|
| Deyan Popovic | Susan Lyon |
|---------------|------------|

Medical Students:

| | | | |
|-----------------|----------------|-----------------|--------------|
| James Carr | Robert Sobut | Denise Mistro | Susan Roth |
| Thomas Lucke | Sarah Keesara | Ragu Thunga | Thomas Walsh |
| Thomas Henthorn | Paul Lyon | Martin Radvany | Ateet Shah |
| Tapubrata Ghosh | Annette Barns | James Misak | Ripal Ghandi |
| Roberta Gausas | Reeva Shulruf | Samir Taneja | |
| William Walsh | Kyle ver Steeg | Sylvester Black | |

Biotechnology Program Students:

| | | |
|-----------------|--------------------|----------------|
| Winnie Pao | Cristina Stadler | Marcia Yoder |
| Ayano Takamoto | Christopher Olenec | Jasbir Kindra |
| Lourdes Bermejo | Jai Syn | Joseph Orlando |
| Uri Ratner | Nami Cho | Lora Kastrup |
| Sanjiv Gupta | Sharon Doering | Clara Smith |
| Ethan Buckley | Scott Rosenblum | Nancy Sullivan |
| Jeffrey Black | | |

Undergraduate Students:

| | | |
|------------------|----------------|-----------------|
| Marlene Morrison | Loretta Liu | Jennifer Shaw |
| Daniel Fryxell | John Zachariah | Jason Roh |
| Michael Baumann | Denise Mistro | Andrew Hong |
| Ragu Thunga | Askok Kukadia | Kirsten Stadler |
| Martin Radvany | Gautham Reddy | SandyShaw |
| Andrew Radvany | Stephanie Wu | Katherine Chen |
| Daniel Roh | David Napochi | Thomas Kim |

Students, Thesis, Present Position

Celia Kaye, M.D., Ph.D.

Cystine Reduction and Transport in Cystinotic and Normal Fibroblasts

Ph.D., Biochemistry, 1985

Head, Genetics, U. of Texas, San Antonio

Linda Hanson, M.S.

Characteristics of the Antigenic Reactivities of Rheumatoid Arthritic Synovial Fibroblasts

M.S., Clinical Pathology, 1976

Lorraine Gill, Ph.D.

Characterization of Reactivities of Anti-Cellular Sera with Tumor Cells in Vitro

Ph.D., Biochemistry, 1977

Research Scientist, New England Nuclear

Margaret Lu Steffes, M.S.

Delineation and Partial Characterization of an Associated Rheumatoid Arthritic Reactive Antigen

M.S. Biochemistry, 1977

Senior Manager, Abbott Labs

Tod B. Sloan, M.D., Ph.D.

A Study of Synovial Cell Antigens

Ph.D., Biochemistry, 1978

Associate Professor, Dept. Anesthesiology, U. of Texas, San Antonio

John Jay Weiss, M.S., Ph.D.

Studies on the Platelet Derived Connective Tissue Activating Peptide

M.S., Clinical Pathology, 1979

Program Director in Allergy, Diagnostic Products Corp.

Lyman E. Davis, M.S., Ph.D.

Immunoassays for Fibronectin

M.S., Clinical Pathology, 1980

Senior Director, Takeda Abbott

Mark L. Pankow, M.S., Ph.D.

Immunochemical Staining of Cancer Tissues

M.S., Clinical Pathology, 1983

Director of R&D, Parke DeWatt Labs

Students, Thesis, Present Position - continued

Lyman E. Davis, M.S., Ph.D.

Specificities of Antibodies to a Carbodiimide and to the Amino-Terminus of a Platelet Mitogen

Ph.D., Tumor Cell Biology, 1984

Senior Director, Takeda Abbott

Ruth A. Entwistle, Ph.D.

A Kinetic Study of Fibronectin and the Clq Component of Complement Ph.D.,

Tumor Cell Biology, 1986

Research Associate, Washington U. School of Medicine

Mark L. Pankow, M.S., Ph.D.

Development of an Assay for Detection of Galactose Terminated Glycoproteins in Biologic Fluids

Ph.D., Tumor Cell Biology, 1988

Director of R&D, Parke DeWitt Labs.

John Jay Weiss, M.S., Ph.D.

Studies of Complement Mediated Interactions Between Fibronectin and Immune Complexes

Ph.D., Tumor Cell Biology, 1989

Program Director in Allergy, Diagnostic Products Corp.

Michael A. Baumann, Ph.D.

Synthetic Peptides with Immune Complex Binding Activity

Ph.D., Tumor Cell Biology, 1990

Research Scientist, Abbott Labs.

Michael J. Shields, Ph.D.

Characterization and Use of Monoclonal and Polyclonal Antibodies

Directed Against C-Reactive Protein in the Fluid and Solid Phase

Detection of Altered Forms of C-Reactive Protein in Humans

Ph.D., Molecular Biology, 1991

Postdoctoral Fellow, National Institutes of Health

Students, Thesis, Present Position - continued

John Joseph Kresl, Ph.D., M.D.

Evaluation of Native Modified Human C-Reactive Protein
Interconversion: Possible Role for Modified C-Reactive
Proteins in Tumor Inhibition

Ph.D., Tumor Cell Biology, 1992, MD, 1993

Staff Physician, Radiation Oncology, St. Mary's
Hospital, Phoenix,

Marilyn R. Brown, Ph.D.

Receptor-Ligand Interactions Between Serum Amyloid P
Component

and Model Soluble Immune Complexes

Ph.D., Tumor Cell Biology, 1993

Research Scientist, Baxter Labs.

Winnie Pao, M.S.

Autoantibodies in Colon Cancer

M.S., Biotechnology Program, 1993

Research Associate, Division of Transplantation, NUMS

Katherine Worthington, Ph.D.

Design of Peptides Binding to Beta-2-microglobulin and
Immunoglobulin G

Ph.D., Tumor Cell Biology, 1994

Research Analyst, Research Corp. Technologies

NaMi Cho, M.S.

Binding of IgG Aggregates to CBP2-Amino Link

M.S., Biotechnology Program, 1994

Postdoctoral Fellow, Boston University

Joseph Orlando, M.S.

CBP2 Binding of Aggregated-IgG

M.S., Biotechnology Program, 1994

Graduate Student, Dept. of Microbiology-Immunology,

Wake Forest University, Bowman Gray School of Medicine

Sanjiv Gupta, M.S.

Detection of a Transferrin Isoform Associated with Alcohol
Consumption

M.S., Biotechnology Program, 1994

Medical Student, University of Indiana

Students, Thesis, Present Position - continued

Jai Syn, M.S.

Specificities of Binding of Lectins to an Aromatic Carbohydrate Mimetic Library

M.S., Biotechnology Program, 1995

Research Associate, Abbott Labs.

Christopher Olenec, M.S.

Binding of Proteins to a Secondary Structure Limited Peptide Library

M.S. Biotechnology Program, 1995.

U.S. Commerce Dept. on FDA Regulations, Washington, D.C.

Lora Tucker-Garcia, M.S.

Carbohydrate Deficient Glycoproteins: Significance in Carbohydrate Deficient Glycoprotein Syndrome, Alcoholism, and Fetal Alcohol Syndrome

M.S., Biotechnology Program, 1996

Research Associate, Abbott Labs.

Uri Ratner

Characterization of Xenoreactive Antibodies Important in Transplant Rejection

M.S. Biotechnology program, 1996

Research Analyst, Venture One

Cristina Stadler

Complement Inhibition by Peptides in Hyperacute Rejection Reactions

M.S., Biotechnology Program, 1996

Division Manager, Baxter Labs.

Lora Kastrup

Study of Vaginal Fluid Oligosaccharides in UTIs

M.S., Biotechnology Program, 1996

Research Associate, Baxter Healthcare Corporation

Jasbir Kindra, M.S., LL.D.

Complement Inhibition Through the Use of Diaromatic Peptides to Allow Xenotransplantation

M.S., Biotechnology Program, 1997

Patent Attorney, Green Bay, WI

Students, Thesis, Present Position

Marcia Yoder, M.S.

Studies on Complement Inhibition by a Diaromatic Peptide,
Tryptophan-Tyrosine

M.S., Biotechnology Program, 1997

Research Associate, Eli Lilly Co.

Sharon Doering, M.S.

Avian IgY antibodies - Use in Xenotransplantation

M.S., Biotechnology Program, 1997

Biotechnology Analyst, Madison Securities

Clara Smith, M.S.

Cross-Linked Avian IgY and Human IgG as Potential
Inhibitors of Rejection in Xenotransplantation

M.S., Biotechnology Program, 1998

Research Scientist, Glaxo Welcome

Committee Service:

Research Committee, Medical and Dental Schools
Sigma XI Symposia
Medical Applicant Interview
 Cancer Center Library
General Services Committee of Faculty Senate
Faculty Senate
Biochemistry Workshop
Departmental Outside Speaker, Equipment, Library
Graduate Affairs Committee
VA Research Development Committee
Executive Committee of the Biochemistry Program
Cancer Center Equipment
Cancer Focus
Medical Admissions
Tumor Cell Biology Program
Comprehensive Examination
Pre-Thesis and Thesis Committees for 33 students
University Research Grants Committee
General Faculty Committee
Graduate Professional Education of the Physician
Task Force on the Future of the Medical Library
Microbiology Department Review Committee
Medical Senate Council
Medical Council
Medical Library Long-Range Planning Committee
Program Review of Microbiology-Immunology
Program Review of Physical Therapy Curriculum
Research Program Committee on Immunobiology
Intellectual Property Committee
Medical School Urology Chair Search Committee
Medical School Division Making Course Development
Committee
 Medical School Research Council
 Biotechnology Program: Executive Committee,
Admissions,
 Advisory Board
Honors Program in Medical Education
Program Review Committee - Mol. Pharm. & Biochem.

**Committee Service 1984 -
University:**

General Faculty Committee, 1982-1985
Subcommittee on Benefits
Chair, GFC/Trustees Meeting, 1983; 1984
Intellectual Property Committee, 1989-1996
University Research Grants Committee, 1973 - 1976;
1995 -
Biotechnology Program: Executive Committee, Admissions,
Advisory Board, 1992 -

Medical School:

Medical Senate Council, 1984-1988
General Profession Education of the Physician
Committee
Chair, Subcommittee on Faculty Involvement, 1985-1986
Research Long-Range Planning in Immunobiology, 1985-
1986
Chair, Research Program Committee on Immunobiology,
1985- 1990
Medical School Admissions, 1972 -
Honors Program in Medical Education, 1996 -

Departmental:

Appointments, Promotion, Tenure
Graduate Affairs
Course/Exam/Certificate - Chair
Promotions - Chair
Library
Recruitment - Chair

Teaching Service:

1. Medical, Biochemistry, laboratory section
Subjects: Statistics, acid-base balance, nutrition, automated analyses, topics in immunology and autoimmune diseases
2. Medical, Biochemistry, lecture
Topics: glycogen metabolism
mucopolysaccharides, saccharide interconversions
glycoproteins
hexose monophosphate pathway
post-ribosomal processing of proteins
3. Medical, biochemistry, lecture and independent study of immunology with students with proficiency in biochemistry
4. Medical, immunology, lectures on antibody structure
and antibody - antigen interactions
5. Medical, basic oncology, lectures on biological membranes
6. Graduate, survey course in immunology
7. Graduate, lecture and seminar on biological membrane topics
8. Graduate, lectures in immunology on antibody structure, antigenic determinants, antibody-antigen interactions, antibody functions
9. Graduate, survey courses in biochemistry,
Topics: carbohydrate structure, analysis;
glycoprotein and glycolipid structure, functions and metabolism;
lipopolysaccharide structure and synthesis; biological membranes; muscle structure
protein structure
protein - ligand binding

enzyme mechanisms
enzyme kinetics

10. Graduate, basic oncology, lectures on biologic membranes
11. Graduate, survey course in immunochemistry
12. Post-Graduate, lecture on inter-relationships of complement, fibrinolytic and kinin systems

LECTURES, MEDICAL BIOCHEMISTRY

1. Glycogen metabolism and regulation
2. Structural complementarily, amplification of metabolic response, disorders in glycogen metabolism
3. Galactose, glucuronic acid metabolism, mucopolysaccharides, saccharide interconversions, hexose monophosphate shunt
4. Post-ribosomal modification of proteins, protein polymorphisms and disease consequences
5. Fatty acid synthesis and degradation
6. Lipid structure and function
7. Phospholipid structure and function

BASIC ONCOLOGY:

1. Structural features of biologic membranes
2. Tumor cell membranes, tumor-associated antigens

GRADUATE BIOCHEMISTRY:

1. Stereochemistry of carbohydrates
2. Conformations of carbohydrates
3. Chemical reactivity and conformation
4. Methodology for structural determinations of carbohydrate sequences
5. Types and characteristics of complex carbohydrates
6. Methods applied to analysis of complex carbohydrates
7. Synthesis of complex carbohydrates
8. Functions of complex carbohydrates
9. Proteins - primary and secondary structure
10. Proteins - Tertiary and quaternary structure
11. Protein-protein and protein-ligand interactions
12. Proteins - structural predictions
13. Enzyme kinetics
14. Enzyme mechanisms
15. Enzymes - Types and regulation

16. Membrane structure and function
17. DNA and RNA structures
18. Principles that determine polynucleotide structure
19. Protein - polynucleotide interactions

LECTURES, DENTAL BIOCHEMISTRY

1. Glycogen metabolism and regulation of blood glucose
2. Structure and function of phospholipids, membrane structure
3. Fatty acid synthesis and degradation
4. Interrelationships and regulation of metabolic pathways

IMMUNOCHEMISTRY:

1. Heterogeneity of the antibody response; classes, subclasses, allo- and idiotypes of Igs
2. Structural features of Igs; discussion of homologies and deduction of structure from amino acid sequence data
3. Effector functions of the Igs
4. Three dimensional structure of Igs and quaternary interactions of domains
5. Antibody combining site constructs
6. Antibody combining site interactions with haptens; serologic specificities
7. Measurement, interpretation and quantitations of antibody-antigen interactions
8. Kinetic analyses of antibody-hapten interactions
9. Radio- and enzyme-immunoassays
10. Parameters of antigenicity and immunogenicity

CANCER PHARMACOLOGY:

1. Progression and selection of tumor cell populations; changes in cell surface composition and interactions with metastases
2. Tumor-associated antigens

RESIDENT AND STAFF LECTURES:

Otolaryngology: lectures on overview of tumor immunology

- Rheumatology:
1. Synovial cell metabolism and antigen, genetic analysis of antigen expression
 2. Protein Polymorphisms: types, effects on protein function, contribution to disease processes

Subjects taught in Medical Biochemistry Laboratory:

1. Principles and methods of automated analyses
2. Acid-base regulation and imbalances
3. Statistical methods and analyses of clinical data
4. Dietary calculations of protein, carbohydrate, lipid, caloric intake and nitrogen balance
5. Presentations, analysis, critique of primary clinical and basic research papers

Current Teaching:

Lectures in graduate biochemistry: Characterizations

of proteins, protein secondary, tertiary and quaternary structures, predictions of protein and peptide structures, binding site interactions of proteins with various ligands, structures of polynucleotides, chemistry, stereochemistry and conformations of carbohydrates, structural types of complex carbohydrates, complex carbohydrate biosynthesis, functions of complex carbohydrates.

Lectures in medical and dental biochemistry: on carbohydrate, lipid and phospholipid structure and function, glycogen metabolism and regulation of blood glucose, fatty acid synthesis and degradation, and integration and regulation of carbohydrate and lipid metabolism.

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Rovis, L., Anderson, B. and Kabat, E.A., "Immunochemical Studies on Blood Group A, B, H, Le^a and Le^b and Precursor I Substances," in Methodologie de la Structure et du

Metabolism des Glycoconjuges, 645-650, 1974.

Enzyme Kinetic Studies

Abstract: Anderson, R. and Czerlinski, G., "Enzyme Amplification for the Detection of Very Low Levels of Substrate Concentration," Biophysical Society, San Francisco, CA, Feb., 1986.

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Connective Tissue Activating Protein

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Abstract: Weiss, J.J., Sloan, T.B., Castor, C.W. and Anderson, B., "Detection of Platelet-Derived CTAP-III in Biologic Specimens," Mid-West Immunology Conference, 1979.

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I Blood Group Antigens

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PATENT APPLICATIONS

1. Binding of immune complexes by modified forms of c-reactive protein.

Applicants: Northwestern University and
Rush - Presbyterian - St. Luke's Medical Center

Inventors: Potempa and Anderson

U.S. application Serial No. 07/582,884,

Filed: October 3, 1990

Refiled: 08/271,137; July 6, 1994 - 2545/73

Status: Issued: January 14, 1997; US Letter

Patent No. 5,593,897

PCT application number PCT/US89/01247

Filed March 31, 1989 (2545/11)

Status: Nationalized

Australian application no. 34485/89

Filed: March 31, 1989 (2545/24)

Status: Issued, 6/11/93; Serial #633488

Japanese application No. 1-504716

Filed: March 31, 1989 (2545/26)

Status: Pending, awaiting examination

Canadian application No. 595,543

Filed April 3, 1989 (2545/10)

Status: Pending, no action yet

EPO application No. 89904944.9

Filed March 31, 1989 (2545/25)

2. A synthetic peptide and its uses

Applicant: Northwestern University

Inventors: Baumann and Anderson

U.S. application Serial No. 07/598,416

Filed: October 16, 1990 (2545/28)

Status: Issued November 15, 1994

Patent Number 5,364,930

PCT application number PCT/US91/07581

Filed: October 9, 1991

Status: Pending

PATENT APPLICATIONS- continued

3. Binding of aggregated immunoglobulin or immune complexes by serum amyloid P component

Applicant: Northwestern University

Inventors: Anderson and Brown

U.S. application Serial No. 07/672,526

Filed: March 19, 1991 (2545/21)

Status: Issued 6/22/93, P-5,221,628

4. Immunoassay for glycosylated proteins employing antibody to reductively glycosylated amino acids

Applicant: Northwestern University

Inventors: Davis and Anderson

U.S. application Serial No. 07/397,781
(2545/5)

08/068,525 (5/27/93) (2545/51)

08/151,073 (11/12/93) (2545/52)

Filed: August 23, 1989

Status: Granted; U.S. Letters Patent No.
5,484,735

PCT application no. PCT/US90/04666

Filed: August 17, 1990 (2545/23)

Status: Nationalized

EPO application no. 90913261.5

Filed: August 17, 1990 (2545/37)

Status: Granted

Japanese application no. 2-512516

Filed: August 17, 1990 (2545/38)

Status: Pending, awaiting examination

PATENT APPLICATIONS- continued

5. Immunoassay for detecting and monitoring alcoholics
Applicants: Northwestern University and Immtech Int.
Inc.

Inventors: Makhlouf, Pankow, Anderson and Bean
U.S. application Serial No. 07/765,169;
Filed: September 25, 1991 (2545/8)
08/272,852; July 08, 1994 (2545/74)
Status: granted

PCT application Serial No. PCT/US92/08136
Filed: September 25, 1992 (2545/44)
Status: Nationalized

EPO application no. 92921176.1
Filed: August 25, 1992 (2545/60), granted

Japanese application no. 5-506376
Filed: 9/25/92 (2545/61)

Canadian application no. 2119651
Filed: 9/25/92 (2545/59), granted

Australian application no. 27577/92
Filed 9/23/92 (2545/58), granted

6. Methods of Treating Cancer Using Modified C-Reactive Protein

Applicants: Northwestern University and Immtech Int.
Inc.

Inventors: Potempa, Kresl and Anderson
U.S. application Serial No. 07/874,263
Filed: April 24, 1992
Status: Issued December 12, 1995
US Letters Patent No. 5,474,904

PCT application no. PCT/US/03769
Filed: 4/22/92 (2545/50)
Status: Nationalized

EPO application no. 93910710.8, Filed: 4/22/93
(2545/81)

Japanese application no.5-518361, Filed: 4/22/93
(2545/80)

Canadian application no. 2432001, Filed: 4/22/93
(2545/80)

Australian application no. 41109/93,
Filed: 4/22/93 (2545/79)

PATENT APPLICATIONS- continued

7. Method of detecting cancer
Applicants: Northwestern University and Immtech Int. Inc.
Inventors: Anderson and Davis
U.S. application Serial No. 07/939,830
Filed: September 3, 1992 (2545/9)
Status: Issued December 27, 1994
Patent Number 5,376,531

Japanese application No. 4-293052
Filed: October 30, 1992 (2545/45)
Status: Pending
8. Methods of Imaging Cancer Cells Using Modified C-Reactive Protein
Applicant: Northwestern University
Inventors: Potempa, Kresl and Anderson
U.S. Application 149,663
Filed Nov. 9, 1993
Status: Issued December 12, 1995
US Letters Patent No. 5,474,904
9. CIP to Synthetic Clq Peptide Fragments - use in transplantation
Applicant: Northwestern University
Inventors: Baumann, Anderson and Fryer
Filed: April 6, 1996 to US patent office
Status: granted

PCT of same:
Application and Inventors: Baumann, Anderson and Fryer
Filed: April 4, 1997
Status: withdrawn
10. Method of Inhibiting Complement
Applicants and Inventors: Anderson and Fryer
Filed: April 14, 1997 to US patent office
Status: granted
11. Peptides Comprising Aromatic D-Amino Acids and Methods Of Use
Inventor: Byron E. Anderson
US patent filed July 3, 2002
PCT application filed July 3, 2003